

REMARKS

The Office action of August 22, 2002, has been carefully considered.

Claims 1 through 5 and 15 have been rejected under 35 USC 103(a) over Miyasato et al.

The product referred to in the Office action, and which is described in Example 1 of Miyasato et al, is a plate which is hot rolled at relatively high temperatures to favor an unrecrystallized condition in the plate after subsequent heat treatment. The term "unrecrystallized" is defined as meaning that the plate is preferably 85 to 100% unrecrystallized, or at least 60% of the entire thickness of the plate product is unrecrystallized. The Office action takes the position that the claimed invention reads on 100% unrecrystallized materials between one-quarter and mid-thickness, and if no recrystallized grains are present, then the intercept distance between recrystallized areas is infinite, and therefore greater than 250  $\mu\text{m}$ .

Applicant has now amended Claim 1 to require at least partial recrystallization. This is clearly supported by the specification, in particular the first paragraph under Summary of the Invention, which states that "[t]he inventors found that for thick products with an only slightly

recrystallized microstructure, a high as-cast grain size (that those skilled in the art would normally tend to avoid) could lead to a specific microstructure of the transformed and heat treated product that has beneficial effect on the toughness, with no reduction in strength or other properties."

Moreover, as is stated at page 7, lines 29-30: "The recrystallized areas form a network of a dimension related by a geometrical transformation to the size of the original as-cast grains."

Thus, as made clear in the specification, the invention is directed to products which have some degree of recrystallization, but that degree of recrystallization is less than 35% by volume. According to Claim 1 as amended, this degree of recrystallization must be greater than zero, and therefore Claim 1 does not read on totally unrecrystallized product.

Because recrystallized grains must be present according to the claimed invention, and because recrystallized areas must be separated by a distance greater than 250  $\mu\text{m}$ , the claimed invention is not obvious over Miyasato et al, and withdrawal of this rejection is requested.

Claims 1 to 3 and 15 have been rejected under 35 USC 103 over ASM Handbook in view of Shahani et al.

The ASM Handbook has been cited for its teaching of several unrecrystallized alloys that are in conventional T6 tempers. However, since Claim 1 does not encompass totally unrecrystallized alloys, the teaching of the ASM Handbook is not relevant to the claimed invention.

It is noted that the ASM Handbook does not teach forged products greater than 12 mm in thickness, but that the Shahani et al reference has been cited for this teaching. However, Shahani et al does not cure the defects of the ASM Handbook as noted above, and withdrawal of this rejection is requested.

Claims 1 to 5, 7 and 15 have been rejected under 35 USC 103 over Shahani et al.

Shahani et al has been cited to show a rolled, extruded or forged AlZnMgCu alloy which is greater than 60 mm in thickness and with a T6 temper. Shahani et al is cited to show that the fraction of recrystallized grains between quarter and mid-thickness is less than or equal to 35% but does not specify the intercept distance between the recrystallized areas. Once again, the Office action takes the position that if no recrystallized grains are present, then the distance between recrystallized areas is infinite and thus greater than 250  $\mu$ m. However, the claimed invention excludes

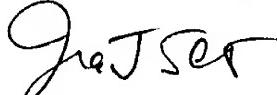
materials with no recrystallization and withdrawal of this rejection is accordingly requested.

Claims 6 and 7 have been rejected under 35 USC 103 over Shahani et al, and the ASM Handbook in view of Shahani et al, the ASM Handbook in view of Shahani et al or Miyasato et al, alone or in view of JP 2000-054051. The Japanese reference has been cited for teaching the advantages of the presence of Ti and B, and the Office alleges that it would have been obvious to add small amounts of Ti and B to unrecrystallized Al alloys. However, it is again noted that Claim 1 has been amended to exclude totally unrecrystallized alloys, and withdrawal of this rejection is requested.

Minor amendments have been made to Claims 5 and 15 to place those claims in better form for U.S. practice.

In view of the foregoing amendments and remarks, Applicant submits that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

Respectfully submitted,



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APPENDIX

IN THE CLAIMS:

1. (Amended) [Rolled] A partially recrystallized, rolled, forged or extruded aluminum alloy product more than 12 mm thick, heat treated by [solutionizing] solution treating, quenching and artificial aging, having a fraction of recrystallized grains measured between one-quarter thickness and mid-thickness of [the] a final wrought product [smaller] less than 35% by volume, and a characteristic intercept distance between recrystallized areas greater than 250 μm.

5. (Amended) The product according to claim 4, wherein the alloy is selected from the group consisting of 7010, 7020, 7040, 7049, 7050, 7055, 7060, 7075, 7149, 7150, 7175, 7349, 7449, and 7475 aluminum alloys.

15. (Amended) Structural member for airframe structures, made [in] of a rolled, forged or extruded product according to claim 1.